

Homework Discussion # 5

Biostatistics 210

2. CREATING PROPENSITIES

The primary interest is in estimating the causal effect of hepatomegaly on survival. Create a simple propensity model (no splines or interactions), make the quintiles, and evaluate the overlap.

```
logistic hepatom female edema bilir copper ast age
predict out, p
xtile group=out, nq(5)
tab group hepat
```

Question 1:

(a) What percent of people in the lowest quintile have hepatomegaly? **12/62 = 19%**

(b) What percent of people in the highest quintile have hepatomegaly? **50/62 = 81%**

Does there appear to be reasonable overlap? **The overlap is quite good.**

3. TESTING INTERACTION

Assess if the effect of hepatomegaly on survival appears homogeneous?

```
cc died hepatom, by(group)
```

```
logistic died i.hepatom##i.group
est store A
logistic died i.hepatom i.group
lrtest A
```

Question 2: What do you conclude? Is there evidence of interaction?

The likelihood ratio test gives a p-value of 0.85 so there is no evidence of a statistically significant interaction. However, the practical significance should be assessed as well. The ORs for the quintiles are 0.8, 1.4, 2.0, 2.8, 1.8 which do not appear to indicate a clinically meaningful interaction.

4. CONDITIONAL ODDS RATIO

Question 3: Estimate the conditional odds ratio

```
logistic died i.hepatom i.group
```

The (conditional) odds ratio is 1.9 with 95% confidence interval 1.0 to 3.4.

5. CAUSAL MEAN AND AVERAGE CAUSAL EFFECT

Question 4: (Assuming no unmeasured confounders) If the entire population had hepatomegaly, what proportion would have died during follow-up? If the entire population did not have hepatomegaly, what proportion would have died during follow-up? What is the estimated risk difference?

```
logistic died i.hepatom i.group
margins hepatom
margins, dydx(hepatom)
```

If everyone had hepatomegaly, the propensity score based on quintiles estimates that 44.7% of people who die and if everyone did not have hepatomegaly this percentage would be 34.2% which yields a risk difference of 10.4% or 0.104

6. REGRESSION MODEL

Question 5: Conduct the usual regression modeling approach adjusting for the variables in which were included in the propensity model. Have your results changed substantially? NOTE: It might be helpful to use the “margins” command here.

If everyone had hepatomegaly, the propensity score based on quintiles estimates that 45.6% of people who die and if everyone did not have hepatomegaly this percentage would be 33.7% -- these are quite similar to the propensity results. The OR based on regression is 2.1 with 95% confidence interval 1.2 to 3.7. This result is also similar to propensity scores. My default would be to report the regression result since the propensity result raises no concerns and the regression result is likely to be well understood.